



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED  
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 638020

No. 00617

A. GENERAL INFORMATION:

1. Spill incident Number: 638020
2. Name of Location 8" OBIGBO NORTH DELIBERT LINE
3. Name of nearest community UMUARE
4. State RIVERS LGA OBIGBO
5. Type of Production facility/Installation PIPELINE Asset owner /District UIG/P/NESP

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 22<sup>ND</sup> MARCH 2011
- b. Date/Period of investigation, 25<sup>TH</sup> MARCH, 2011
- c. Description of spill point environment

- |  |       |       |
|--|-------|-------|
| <input type="checkbox"/> Firmed soil               | [Y] ✓ | [N]   |
| <input type="checkbox"/> Loose soil                | [Y]   | [N] ✓ |
| <input type="checkbox"/> Previously excavated area | [Y] ✓ | [N]   |
| <input type="checkbox"/> Under water               | [Y]   | [N] ✓ |
| <input type="checkbox"/> Swampy                    | [Y]   | [N] ✓ |
| <input type="checkbox"/> Exposed pipe surface      | [Y]   | [N] ✓ |

d. Description of leak point (tick as applicable);

- |  |       |       |
|--|-------|-------|
| <input type="checkbox"/> Drilled hole,                                 | [Y]   | [N] ✓ |
| <input type="checkbox"/> Hack saw cut,                                 | [Y]   | [N] ✓ |
| <input type="checkbox"/> Explosive tear,                               | [Y]   | [N] ✓ |
| <input type="checkbox"/> Complete Rupture                              | [Y]   | [N] ✓ |
| <input type="checkbox"/> Inward dent,                                  | [Y]   | [N] ✓ |
| <input type="checkbox"/> Well head tampering                           | [Y]   | [N] ✓ |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve,         | [Y] ✓ | [N]   |
| <input type="checkbox"/> Missing pipeline (flowline)                   | [Y]   | [N] ✓ |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point,    | [Y] ✓ | [N]   |
| <input type="checkbox"/> Third party tampering with Clamp Bolt/Nut,    | [Y]   | [N] ✓ |
| <input type="checkbox"/> Third party tampering with valve setting,     | [Y]   | [N] ✓ |
| <input type="checkbox"/> Third party tampering with flange Nuts/bolts, | [Y]   | [N] ✓ |
| <input type="checkbox"/> Corrosion,                                    | [Y]   | [N] ✓ |
| Type: _____  |       |       |
| <input type="checkbox"/> Saver-pit over flow,                          | [Y]   | [N] ✓ |
| <input type="checkbox"/> Surge vessel overflow,                        | [Y]   | [N] ✓ |
| <input type="checkbox"/> Outward dent                                  | [Y]   | [N] ✓ |
| <input type="checkbox"/> Others (specify). _____                       |       |       |

AFTER JOINT  
 INVESTIGATION  
 OF THE INCIDENT  
 SPILL WAS  
 FOUND TO BE  
 DUE TO THIRD  
 PARTY  
 INTERFERENCE

e. Spill point coordinates

Northing: (MINNA MID-BELT) Easting:

94252.50m 518043.46m.



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C. RISK/DAMAGE ASSESSMENT

7. Type of environment of spill site:

- Land ✓
- Swamp
- water

Type of environment of which oil has spread:

- Land ✓
- Swamp
- water

8. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [ ,m]
  - Drinking water source [ ,m]
  - Built up area [ ,m]
  - Farmlands [ ,m]
  - Fish Farm/Pond [ ,m]
  - Fishing net [ ,m]
  - Others (specify). [ ,m]
- } NOT APPLICABLE

9. Containment measures put in place;

- Booms [ Y ] [ N ] ✓
- Trench [ Y ] [ N ] ✓
- Dyke [ Y ] [ N ] ✓
- Others: \_\_\_\_\_

10. Any pictures or video coverage? [ Y ] ✓ [ N ]

11. Was there any disruption to the investigation? [ Y ] [ N ] ✓

If yes give brief description:

\_\_\_\_\_  
 \_\_\_\_\_  
 NOT APPLICABLE  
 \_\_\_\_\_

D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL

A. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
	NONE WITHIN AREA OF IMPACT				



B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
	NONE WITHIN AREA OF IMPACT					

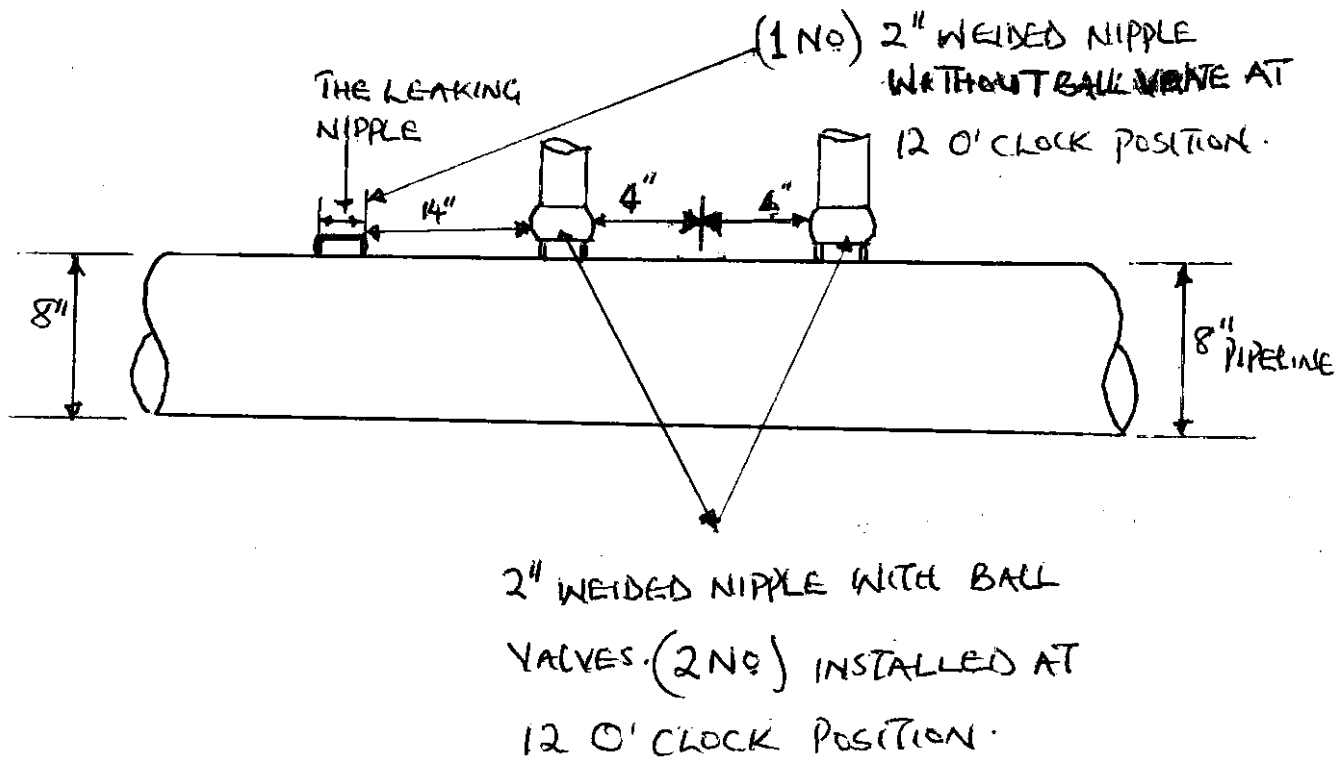
C. Fish/Nets/Ponds

S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

D. Others (Specify) i.e. Animal Traps

S/N	Others	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

E. GRAPHIC DESCRIPTION OF LEAK POINT (Details should be contained in leak repair report)





F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

E. Coordinates (IMPACTED AREA BOUNDARY COORDINATES)

S/N	Northing (MINNA MID BET)	Easting
23	94249.42 m	518046.94 m
24	94255.57 m	518046.55 m
25	94252.45 m	518068.11 m
26	94246.32 m	518061.94 m



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**G. INCIDENT INFORMATION:**

17 Impacted Area Details

- a. Total calculated area of impact 0.012305 Ha
- Impact within SPDC R.O.W 0.012305 Ha
  - Impact outside R.O.W NIL

18 Volume of oil recovered before completion of JIV ( $V_{rec}$ ):

Recovered oil $V_{rec}$ :	<u>NIL</u>	barrels
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19. Computation of the residual volume on site

a. Computation of the volume of pooled free phase oil (on land or confined water body).

- i. Area ( $m^2$ ) occupied by pool of free phase oil 55.37  $m^2$
- ii. Average Depth (m) of pool of free phase oil 0.001m
- iii.

Volume of pooled of free phase oil: $V_{pool}$ :	<u>0.77</u>	barrels
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iv.

b. Computation of volume of infiltrated oil in the soil ( $V_3$ ).

- i Area ( $m^2$ ) covered by the oil: 98.44  $m^2$
- ii Average Depth (m) below ground surface of infiltration of oil: 0.005m
- iii Soil type: CLAY
- iv.  $p_e$  (effective porosity of the soil): 8%
- v.

Volume of infiltrated oil in the soil: $V_3$ :	<u>0.25</u>	barrels
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20. Computation of volume of oil on open water based on standard coloration.

	Thickness (mm)	Percentage coverage	Volume ( $m^3$ )
Barely Visible	0.00004		
Silvery	0.00008		
Slight Colour	0.00015	<u>NOT</u>	
Bright Colour	0.0003		
Dull	0.001	<u>APPLICABLE</u>	
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
	Percent Total	100%	Total Volume <u>NIL</u> bbl

Spill Factors from USCG FOG (2000 Edition)



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Volume of oil on open water - $V_{wat}$ :	<u>NIL</u>	barrels
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21. Calculation of evaporated volume:

- i. Oil type: BONNY MEDIUM
- ii. E-Factor: 15%
- iii.

Volume of evaporated oil - $V_{vap}$ :	<u>0.18</u>	barrels
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Oil Type		Bonny Light	Bonny Medium
		E-Factor	E-Factor
Period Since Oil Spill	<1 day	10%	5%
	1-7 days	25%	15%
	>7 days	40%	25%

9. Gross Total Estimated Spilled Volume  $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 0.18 + 0.25 + 0.77 = 1.20 \text{ Bbls}$

10. Net Total Estimated Spilled Volume  $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 0.18 + 0.25 + 0.77 = 1.20 \text{ Bbls}$

- \*Calculation of the respective estimated volume is to done using the new spill estimation software on site
- \*Conversion of m3 to barrel is Total volume VT (m3) x6.29
- \*Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 25 / 03 / 20 11 at incident site by joint investigation representative from

- Host Community
- Department of Petroleum Resources [DPR]:
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]:
- Shell Petroleum Development Company [SPDC]:

*Tick as applicable*